

## Window Fact Sheet

### Introduction

Windows are typically the weakest sound reducing link in a home. Obviously, an open window permits sound to travel inside the home as if no window existed. However, even a closed window can transmit significant amounts of noise.

Sound travels through a window in two ways. First, air (and sound) will find the path of least resistance through leaks around the window frame and the sashes (the part of the window that opens). By reducing the amount of air that leaks around the window structure, noise can be reduced. Caulking around the window frame or adding new highquality storm windows can accomplish this. The noise reducing benefits of this range from unnoticeable to moderate noise reduction.

The second path that sound takes through a window is the frame and glass itself. Sound travels through a medium (air, wood, glass, aluminum, etc.) as vibrations. Generally, the heavier or stiffer an object is, the more resistant it is to vibration.

The type of glass that is used can also have an effect on noise reduction. Laminated glass (two sheets of glass bonded together with a plastic-type interlayer) can be effective at reducing noise. Some manufacturers will build a double-paned window with two



panes of glass, each of a different thickness (e.g., 3/16" glass and 1/4" glass separated by a 1/2" air space). This works on the principle that glass of different thickness vibrates at different frequencies, some of which will cancel each other out and reduce noise transmission.

Windows designed for airport sound insulation programs are usually made of vinyl or aluminum, and are constructed differently than windows designed for energy efficiency alone. The noisereducing performance of a window is measured by the Sound Transmission Coefficient (or STC) rating of the window. The higher the number, the more noise is reduced. Most airport sound insulation programs install windows with STC ratings of 37 to 41. A good quality vinyl window manufactured for energy efficiency might have an STC rating of 28 to 35. Storm window products can also be obtained that have STC ratings.

### What can I do for my home?

There are several steps that a homeowner can take to reduce aircraft noise that is transmitted by the window. The cost to make window improvements can vary from a few hundred dollars to several thousand dollars. Costs will also depend upon several variables:

- The type of home you live in
- The age of the home you live in
- Who does the work (hiring a contractor is more expensive than doing it yourself)
- The type of products you choose
- The brand of products you choose

*Remember, your ear cannot hear a change in noise of less than 3 dB.*

| Action  | Cost             | Acoustic Benefit    |
|---|------------------|---------------------|
| Re-caulk and seal existing windows                      | Low              | Minimal (<3 dB)     |
| Add new storm windows                                   | Moderate         | Moderate (3 - 5 dB) |
| Replace all windows with thermal windows <sup>(a)</sup> | Moderate to High | Moderate (3 - 5 dB) |
| Replace all windows with new acoustic windows           | High             | Good (>5 dB)        |

*(a) - Due to the wide range of products available in the replacement window marketplace, it is difficult to provide exact data for acoustic benefit.*

### What should I do next?

Although the airport cannot recommend specific contractors or suppliers of materials, we encourage you to shop around and ask questions. If you are interviewing contractors, you may want to consider asking:

- What type of insurance do you carry?
- What brand of product will you be using?
- What is the manufacturer's warranty?
- What is the contractor's warranty on the work?
- Who will be my daily contact on the job?
- When can you start the work, and how long will it take?
- What are my responsibilities during the project?
- Is the price quote what I will actually pay or an estimate?
- Always ask for references and check them out!